



FirstEnergy Nuclear Operating Company

Perry Nuclear Power Plant  
P.O. Box 97  
10 Center Road  
Perry, Ohio 44081

Frank Payne  
Vice President

440-280-5382

September 20, 2019  
L-19-194

10 CFR 50.73(a)(2)(iv)(A)

ATTN: Document Control Desk  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

SUBJECT:  
Perry Nuclear Power Plant  
Docket No. 50-440, License No. NPF-58  
Licensee Event Report Submittal

Enclosed is Licensee Event Report (LER) 2019-003, "Equipment Fault causes Turbine Stop Valve Closure and Reactor Protection System Actuation". There are no regulatory commitments contained in this submittal.

If there are any questions or if additional information is required, please contact Mr. Glendon Burnham, Manager – Regulatory Compliance, at (440) 280-7538.

Sincerely,

A handwritten signature in black ink, appearing to read "Frank Payne", is written over a large, stylized, handwritten "F" that serves as a background for the signature.

Frank R. Payne  
Vice President

Enclosure:  
LER 2019-003

cc: NRC Project Manager  
NRC Resident Inspector  
NRC Region III Regional Administrator

Enclosure  
L-19-194

LER 2019-003

**LICENSEE EVENT REPORT (LER)**

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

**1. Facility Name**

Perry Nuclear Power Plant

**2. Docket Number**

05000-440

**3. Page**

1 OF 3

**4. Title:**

Equipment Fault causes Turbine Stop Valve Closure and Reactor Protection System Actuation

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Rev No.	Month	Day	Year	Facility Name	Docket Number
07	27	2019	2019	003	00	09	25	2019	Facility Name	Docket Number
9. Operating Mode										
11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)										
1			<input type="checkbox"/> 20.2201(b)			<input type="checkbox"/> 20.2203(a)(3)(i)			<input type="checkbox"/> 50.73(a)(2)(ii)(A)	
			<input type="checkbox"/> 20.2201(d)			<input type="checkbox"/> 20.2203(a)(3)(ii)			<input type="checkbox"/> 50.73(a)(2)(ii)(B)	
			<input type="checkbox"/> 20.2203(a)(1)			<input type="checkbox"/> 20.2203(a)(4)			<input type="checkbox"/> 50.73(a)(2)(iii)	
			<input type="checkbox"/> 20.2203(a)(2)(i)			<input type="checkbox"/> 50.36(c)(1)(i)(A)			<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	
10. Power Level			<input type="checkbox"/> 20.2203(a)(2)(ii)			<input type="checkbox"/> 50.36(c)(1)(ii)(A)			<input type="checkbox"/> 50.73(a)(2)(v)(A)	
98			<input type="checkbox"/> 20.2203(a)(2)(iii)			<input type="checkbox"/> 50.36(c)(2)			<input type="checkbox"/> 50.73(a)(2)(v)(B)	
			<input type="checkbox"/> 20.2203(a)(2)(iv)			<input type="checkbox"/> 50.46(a)(3)(ii)			<input type="checkbox"/> 50.73(a)(2)(v)(C)	
			<input type="checkbox"/> 20.2203(a)(2)(v)			<input type="checkbox"/> 50.73(a)(2)(i)(A)			<input type="checkbox"/> 50.73(a)(2)(v)(D)	
			<input type="checkbox"/> 20.2203(a)(2)(vi)			<input type="checkbox"/> 50.73(a)(2)(i)(B)			<input type="checkbox"/> 50.73(a)(2)(vii)	
						<input type="checkbox"/> 50.73(a)(2)(i)(C)			<input type="checkbox"/> Other (Specify in Abstract below or in NRC Form 366A)	

**12. Licensee Contact for this LER****Licensee Contact**

George Dujanovic – Regulatory Compliance

**Telephone Number (Include Area Code)**

440-280-5200

**13. Complete One Line for Each Component Failure Described in this Report**

Cause	System	Component	Manufacturer	Reportable to ICES	Cause	System	Component	Manufacturer	Reportable to ICES
B	TG	SOL	G080	Y					

**14. Supplemental Report Expected****15. Expected Submission Date**☐ Yes (If yes, complete 15. Expected Submission Date) ☒ No

Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On July 27, 2019, at 1929 hours, the Reactor Protection System (RPS) automatically actuated due to a closure of the turbine stop valves. This event was caused by a failed component in the mechanical overspeed trip testing circuit.

The defective component was replaced, restoring the mechanical overspeed testing circuit. The apparent cause of the event was determined to be infant mortality of mechanical shutoff valve 1N32F0400, as the valve had been replaced four months earlier during the last refueling outage.

A corrective action will evaluate and apply enhanced procurement for the Electro Hydraulic Control (EHC) Single Point Vulnerability components that are a part of the turbine front standard.

The plant responded as expected and all control rods inserted fully. The safety significance of this event is considered very small in accordance with the Regulatory Guidance. This event is reported in accordance with 10 CFR 50.73(a)(2)(iv)(A) as an event or condition that resulted in an automatic actuation of the RPS and a valid actuation of the Reactor Core Isolation Cooling (RCIC) system.

**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Perry Nuclear Power Plant	05000-440	2019	- 003	- 00

**NARRATIVE**

Energy Industry Identification System (EIIIS) codes are identified in the text as [XX].

**INTRODUCTION**

On July 27, 2019, with the plant in Mode 1 at approximately 98 percent rated thermal power, the Reactor Protection System (RPS) [JC] automatically actuated due to closure of the turbine stop valves [SHV]. The turbine stop valve closure was caused by a fault in the turbine mechanical overspeed trip test circuit. The plant responded as expected, all control rods inserted, and there were no automatic Emergency Core Cooling System (ECCS) actuations. At 2231 hours, notification was made to the NRC Operations Center (Event Notification EN 54185) in accordance with 10 CFR 50.72(b)(2)(iv)(A) as an event or condition that results in an actuation of the RPS when the reactor is critical and 10 CFR 50.72(b)(2)(iv)(B) due to a valid actuation of the Reactor Core Isolation Cooling (RCIC) [BN] system. This event is being reported in accordance with 10 CFR 50.73(a)(2)(iv)(A) as an event or condition that resulted in an automatic actuation of the RPS and a valid actuation of the RCIC system.

**EVENT DESCRIPTION**

On July 27, 2019 at 1929 hours, an RPS actuation was automatically initiated due closure of the turbine stop valves. The Main Steam Isolation Valves (MSIVs) [ISV] were closed to slow down the reactor vessel cooldown rate, and RCIC was manually initiated to assist with pressure and level control in the reactor.

Prior to the RPS actuation, the weekly main turbine mechanical overspeed test was being performed. Normally, the trip signal is locked out by the mechanical overspeed lockout valve solenoid [SOL], so that the testing does not result in an actual main turbine trip. During the test, the testing circuit indicated "Locked Out", which normally signifies that the testing will lock out the normal turbine trip and allow the mechanical overspeed trip to be tested. As the testing circuit sequenced through the test, the turbine stop valves closed, resulting in an RPS actuation.

Subsequent troubleshooting and component analysis revealed that the mechanical shutoff valve was faulty. This component had been replaced during the previous refueling outage. The mechanical shutoff valve was replaced, along with other components during the troubleshooting, and the main turbine mechanical overspeed trip test was performed successfully.

**CAUSE OF EVENT**

The direct cause of the closure of the turbine stop valves, followed by an RPS actuation, was a faulty mechanical shutoff valve in the testing circuit for the main turbine overspeed trip test.

The apparent cause of the event was determined to be due to infant mortality of mechanical shutoff valve 1N32F0400, as the valve was replaced four months earlier during the last refueling outage.



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**NARRATIVE**

**EVENT ANALYSIS**

A Probabilistic Risk Assessment (PRA) evaluation was performed for the July 27th, 2019 automatic scram. A conservative analysis of this uncomplicated plant scram results in an increase in Core Damage Frequency (CDF) that is well below the acceptable threshold discussed in Regulatory Guide 1.174. The calculated increase in risk for this event is therefore considered to be very small.

**CORRECTIVE ACTIONS:**

The mechanical shutoff valve (defective component) was replaced.

A corrective action is in place to evaluate and apply the enhanced procurement process for the Electro Hydraulic Control (EHC) [JJ] Single Point Vulnerability components that are a part of the turbine front standard.

**Previous Similar Events**

A review of LERs and the corrective action database for the past three years identified no similar events.

**COMMITMENTS**

There are no regulatory commitments contained in this report. Actions described in this document represent intended or planned actions, are described for the NRC's information, and are not regulatory commitments.